

WHAT IS CLAIMED IS:

1 1. An intake apparatus for an internal combustion engine,
2 the internal combustion engine including a plurality of
3 engine cylinders and an intake port connected to each of the
4 engine cylinders, the intake apparatus comprising:
5 a partition extending in a longitudinal direction of the
6 intake port so as to divide an inside region of the intake
7 port into a first passage and a second passage; and
8 a gas motion control valve including a rotatable valve
9 element disposed upstream of the partition and spaced from
10 an upstream end of the partition, the gas motion control
11 valve having a full-closed position where the valve element
12 prevents intake air from flowing into the second passage of
13 the intake port and a full-open position where the valve
14 element allows the intake air to flow into the second
15 passage of the intake port, the valve element being inclined
16 so as to guide a flow of the intake air to the first passage
17 of the intake port when the gas motion control valve is in
18 the full-closed position, the valve element and the
19 partition cooperating with each other to define an
20 interspace between the valve element and the upstream end of
21 the partition when the gas motion control valve is in the
22 full-closed position.

1 2. The intake apparatus as claimed in claim 1, wherein the
2 gas motion control valve comprises a rotatable valve shaft
3 on which the valve element is fixedly supported, the valve
4 element comprising a main portion extending from the valve
5 shaft toward an upstream side of the valve shaft, the main
6 portion preventing the intake air from flowing into the
7 second passage of the intake port when the gas motion
8 control valve is in the full-closed position.

1 3. The intake apparatus as claimed in claim 1, wherein the
2 valve shaft is located on a plane extending from the
3 partition, the valve element being aligned in plane with the
4 partition when the gas motion control valve is in the full-
5 open position.

1 4. The intake apparatus as claimed in claim 1, wherein the
2 valve element has an inclination smaller than 90 degrees
3 when the gas motion control valve is in the full-closed
4 position, the inclination being defined by the valve element
5 and a reference plane extending from the partition toward an
6 upstream side of the partition.

1 5. The intake apparatus as claimed in claim 4, wherein the
2 inclination is in a range of 30-40 degrees.

1 6. The intake apparatus as claimed in claim 1, wherein the
2 internal combustion engine comprises a cylinder head
3 defining the engine cylinders and an intake manifold mounted
4 to the cylinder head, the partition being provided in the
5 cylinder head, the gas motion control valve being provided
6 in the intake manifold.

1 7. The intake apparatus as claimed in claim 1, wherein the
2 valve element partially projects toward the first passage of
3 the intake port when the gas motion control valve is in the
4 full-closed position.

1 8. The intake apparatus as claimed in claim 1, wherein the
2 second passage of the intake port is a lower region of the
3 intake port that is located below the partition in an up-
4 and-down direction of the engine cylinder, the first passage
5 of the intake port being an upper region of the intake port

6 that is located above the partition in the up-and-down
7 direction of the engine cylinder.

1 9. An intake apparatus for an internal combustion engine,
2 the internal combustion engine including a plurality of
3 engine cylinders and an intake port connected to each of the
4 engine cylinders, the intake apparatus comprising:

5 split means for dividing an inside region of the intake
6 port into a first passage and a second passage which extend
7 in a longitudinal direction of the intake port; and

8 valve means for controlling intake air flowing into the
9 second passage of the intake port, the valve means guiding a
10 flow of the intake air to the first passage of the intake
11 port when the valve means prevents the intake air from
12 flowing into the second passage of the intake port, the
13 valve means cooperating with the split means to recirculate
14 a part of intake air flowing toward the engine cylinder
15 through the first passage of the intake port, to an upstream
16 end of the first passage of the intake port through the
17 second passage of the intake port when the valve means
18 prevents the intake air from flowing into the second passage
19 of the intake port.

1 10. The intake apparatus as claimed in claim 8, wherein the
2 valve means defines an inclination smaller than 90 degrees
3 with respect to a reference plane extending from the split
4 means toward an upstream side of the split means when the
5 valve means prevents the intake air from flowing into the
6 second passage of the intake port.

1 11. The intake apparatus as claimed in claim 10, wherein
2 the inclination is in a range of 30-40 degrees.